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(54) MEDICINAL SOAP

MEDIZINISCHE SEIFE

SAVON MEDICINAL

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Description

[0001] The present invention relates to soap. In one embodiment, the present invention relates to a medicinal soap that alleviates and/or arrests the symptoms brought about by, or associated with, diseases and/or conditions such as eczema, dermatitis, acne, psoriasis, athlete's foot and various skin allergies.

[0002] Soap is an anionic surfactant. Soaps are made from fats and oils, or their fatty acids, by treating them chemically with a strong alkali. The fats and oils used in making soap generally come from animal or plant sources. Each fat or oil is made up of a distinctive mixture of several triglycerides, each triglyceride including three fatty acid molecules attached to one molecule of glycerine. There are many different types of triglycerides; each type consisting of its own particular combination of fatty acids.

[0003] Saponification of fats and oils is the most commonly used soap making process. This involves heating the fats and oils, and reacting them with an alkali, usually in liquid form, to produce soap and water (neat soap) and glycerine.

[0004] Another process for making soap involves the neutralisation of fatty acids with an alkali. In this process, the fats and oils are hydrolysed with a high pressure steam to yield crude fatty acids and glycerine. The fatty acids are then purified by distillation and subsequently neutralised with an alkali to produce soap and water (neat soap).

[0005] One of the by-products of the soap making process is glycerine. Glycerine is usually removed from the final product, because it is inclined to soften the soap and moreover, due to its inherent moisturising qualities is perceived to have greater value as a base for shampoos, bath oils, skin creams and like products.

[0006] When the alkali is sodium hydroxide, a sodium soap is formed. Sodium soaps are "hard/solid" soaps. When the alkali' is potassium hydroxide, a potassium soap is formed. Potassium soaps are softer and are found in some liquid hand soaps and shaving creams. Contextually, it is to be understood that any reference to a sodium soap is to be construed to mean that the soap product is hard or in solid form, for example, a bar of soap of any shape, and that any reference to a potassium soap is to be construed to mean that the soap product is in liquid or gel form, for example, a liquid hand soap.

[0007] Some soaps tend to absorb moisture from the skin leaving the skin dry. This can exacerbate certain skin conditions caused by dry skin, for example, eczema. In addition, it is not uncommon for certain constituents of soap, for example, colourants etc. added to the soap to make it more desirable to act as an allergen. As a result, there is a need to provide soaps, which are moisturising and/or hypoallergenic.

[0008] Sapropel is a clay-like material, which is known as a source material for oil and natural gas. The term, sapropel, is derived from the Greek *sapros,* meaning "decayed" and *pelos* meaning "mud", and denotes a range of marine and lacustrine sediments containing organic and inorganic components. Sapropels range from the black organic oozes associated with the Silurian rock formations to variously coloured Holocene deposits.

[0009] A soap for medicinal purposes is known from GB-A-451559 ; said soap comprises sea rund.

[0010] Further, RD97211 discloses a composition for the treatment of psoriasis; said compositioncomprises sapropelic rund.

[0011] Another composition for the treatment of skin related diseases is Kknown from US-B1-6267962. This composition includes peat.

[0012] Tabulated below is a list of countries and regions of the world where sapropel is reported to be found, together with a description of geological age.

Table 1

Continent	Type of deposit
Northern Europe:	
Finland	Lacustrine Quaternary
Sweden	ditto
Estonia	ditto
Latvia	ditto
Lithuania	ditto
Denmark	ditto
Netherlands	ditto
Baltic Sea	Marine Quaternary
Central Europe:	
Czech Republic	Lacustrune Quarternary
East Germany	ditto

(continued)

Central Europe:	
Poland	ditto
Northern Italy	ditto
Romania	ditto
Southern Europe:	
Mediterranean Sea	Marine Silurian - Quarternary
Black Sea region	ditto
CIS:	
Belarus	Lacustrine Quaternary
Ukraine	ditto
Russia	ditto
Kaleria	ditto
Siberia: Omsk	ditto
Yakutsk	ditto
Nizhny Novgorod	ditto
Tomsk	ditto
The USA:	
Arkansas	Lacustrine Quaternary
Florida	ditto
Minnesota	ditto
Nebraska	ditto
Wisconsin	ditto
Canada	Lacustrine Quaternary
South America:	
Venezuelan coast	Marine Quarternary
Australia:	
Lake Cooroong	Lacustrine Quarternary
Africa:	
Namibia	Lacustrine Quaternary

Table 1: Countries and regions of the world where sapropel is reported to be found, together with description of geological age. Source: Andersons (1996).

[0013] Deposits of sapropel are mainly associated with sub-boreal lakes of Northern Europe, Siberia, Canada and the northern states of the U.S.A. Within Europe there are concentrations of sapropel-rich lakes in Karelia, Estonia, Latvia, Lithuania, Poland and the Czech Republic. Smaller amounts are reported to exist in Denmark, Finland, Sweden, the Netherlands, northern Italy and eastern parts of Germany. Extensive deposits are also found in the Russian Federation, Belarus and Ukraine.

[0014] As will be appreciated, not all sapropels are found as lake deposits. They may have their origin in peat formed in subsequent layers of vegetation. For example, sapropel from the Lake Sakhtysh region of north-west Russia is mined from beneath dry peat land.

[0015] Marine sapropels can also occur which are also Holocene. They are associated with the seas bordering arid regions, such as Namibia and the Sierra Nevada of Venezuela, and the eastern Mediterranean and Black Sea in Europe.

[0016] In the European regions, sapropels have been reported to form at a rate of 1mm per annum. The organic components of sapropel accumulates in micro-laminations from a continuous rain of organic debris originating in vast reed beds bordering the lakes and is therefore autochthonous, i.e. originating from within the area of the lake. The inorganic component of sapropel is probably allochthonous, i.e. originating from outside the lake, but the migration of certain minerals such as calcium, magnesium and sulphur may originate from allochthonous organic sources.

[0017] Many sapropels are almost white-to-cream coloured. This reflects the amount of organic matter contained therein. As will be appreciated, as the organic component within the sapropel increases it will assume a darker colour; some sapropels are jet black.

[0018] Sapropels exhibit varying alkalinity. In this connection, sapropels having a pH greater than 7 are termed "lime-sapropels" and are usually characterised by the presence of several species of snails.

[0019] Sapropel can form in marine environments, as well as in freshwater lakes.

[0020] In marine environments, where the sea floor is too deep to allow oxygen to remain dissolved, sulphur-rich water acts as a reducing agent and provides an environment where organic debris can form sapropel. The sulphur itself is derived from the partial decomposition of plant and animal matter. In the areas of the sea beds where deposits of sapropel are found, the adjacent landmass is usually arid and well-leached of plant-growth supporting minerals. This may result in a correspondingly high supply of nutrients supporting a rich diversity of biota off the coast.

[0021] Typically, sapropel-rich lakes are situated on low-lying land. Generally, the lake bedrock is relatively insoluble and the lakeside soils tend to be podzols, from which nutrients are easily leached. As will be appreciated, the lakes themselves become sumps for these mobilised mineral salts, which are assimilated by reed beds that act as water-purifying agents. Sapropel forms on the lake floor in much the same way as peat forms on a raised or blanket bog. The organic compound is derived from limnic (surface) vegetation, in particular, reeds. As these herbaceous plants pass through their annual cycle of growth and decay, they give rise to a continuous stream of organic waste material that accumulates on the lakebed. Here decomposition is continued in the form of digestion of the lignified tissues. Sulphur from protein bonding is liberated in the form of hydrogen sulphide gas, which combines with dissolved oxygen to form soluble sulphurous acid. In a typical sapropel lake, there is little replacement oxygen as the water tends to be stagnant, and after a while, all the available oxygen is used up such that decomposition slows down, and eventually stops altogether. Thereafter, the digestion of organic material becomes anaerobically controlled, giving rise to chemical reductions and the precipitation of certain minerals.

[0022] Some lakes have been accumulating sapropel undisturbed for over 10,000 years. In some places, deposits of sapropel have displaced nearly all of the water. For example, Lake Zebris in Latvia has approximately a half metre depth of water remaining.

[0023] As will be appreciated not all sapropel deposits are found in the lacustrine environment. For example, in the Lake Sakhtysh region of northern Russia, water has receded in recent time and some of the former lake land has undergone a succession to moss or reed beds, with a layer of peat formed above the sapropel deposit.

[0024] In the past, sapropel has been utilised as a fertiliser. In this connection, the use of sapropel as a fertiliser has not been pursued due to its low nitrogen content; this, despite the fact, that many attempts have been made to increase its nitrogen content. In addition; due to its mineral content, sapropel has also been utilised in some countries as a supplement to animal feed.

[0025] In a first aspect of the present invention there is provided soap characterised in that the soap includes sapropel and glycerine.

[0026] Based on their research, the inventors have surprisingly discovered that there is a synergy between glycerine, which is usually removed from soap, and sapropel when present in soap. Such synergy resulting in a soap which is not only moisturising, but also arrests or reverses the symptoms, for example, cracked skin, associated with, or brought about by, skin complaints, diseases or conditions such as eczema, dermatitis, psoriasis, acne, athlete's foot and skin allergies.

[0027] In a further aspect of the present invention there is provided the soap of the present invention for use as a medicament. In particular, the soap of the present invention can be used to arrest or reverse the symptoms of cracked skin and/or itchiness and/or weeping and/or rashes indicative of skin complaints or conditions such as eczema, dermatitis, psoriasis, acne, athletes foot and skin allergies.

[0028] In addition, another advantage of including sapropel is that being mildly abrasive it has the added advantage of acting as an exfoliant.

[0029] A process for making three non-limiting embodiments of soap in accordance with the present invention will now be described by way of reference to Table 1 below, which lists the reactants utilised to make three different types of soap of the present invention. Such soaps internally designated 1398, 1397 and 1393 respectively.

Table 1

Oil	Olive Oil %	Coconut Oil %	Castor Oil %	Beeswax %	Fragrance g *Colour*	Rainwater g	NaOH g	Sapropel Dry white g	Sapropel Dry black g
Function	Main ingredient	Lathering agent	Hardener	Catalyses saponification	Appeal				
Soap 1398 Bay Rum 100 x 80g bars approx Oil mass: 8332g (5% superfatted*)	48	42	8	2	Bay Rum 60 Rosewood 30 Orange 20 Pine 10 *Turmeric 20*	3165	1297	10	
Soap 1397 Pelo Two Oil mass: 8334g (5% superfatted*)	66 30		2	2	Orange 60 Bergamot 30 Bay Rum 20 Pine 5 *Turmeric 20*	3165	1245	10	
Soap 1393 Pelo Hortus (5% superfatted*)	50	40	5	5	Pine 50 Litsia 10 Bergamot 10 *Chlorophyll 20*	3040	1222		160
* superfatted = % of surplus of oils over that usually required to achieve saponification									

[0030] The sapropel component of the soap was first prepared. In the event that the saproprel component was black sapropel, it was oven dried by convection and then dry roasted to arrive at a fine powder. In the event that the sapropel component was white sapropel, it was air dried and subsequently ground to form a fine powder.

[0031] The beeswax, which was included to catalyse the saponification reaction resulting in the soap, was then heated until it was in liquid form. So too were the coconut oil and the olive oil. Both were heated to approximately 65 °C and then, with a view to facilitating the blending of the oils, were cooled to 40 °C.

[0032] The NaOH was then added to the water and was allowed to stand until it had reached the same temperature as the oils, approximately 40 °C.

[0033] The oils and mixture of water and NaOH were then added to a batch reactor, preferably a steam double boiler with offset rotary paddle. In addition, in order to catalyse the reaction, soap from a previous batch was also added to the reactant mixture.

[0034] After about an hour, the pH of the reactant mixture was tested. When a pH of about 8 had been reached the desired fragrances and colour constituents were added.

[0035] The resultant mixture, whilst still in a liquid state, was subsequently poured off into stainless steel column moulds, insulated and placed in a warm room where they remained for 6 days. This enabled the saponification reaction to continue in the moulds until the mixture solidifies.

[0036] The resultant soap was then removed from the moulds and allowed to dry for a further 2 weeks. The soap was then subsequently cut into bars and stacked for 8 weeks, during which time the soap loses water, shrinks and stabilises.

[0037] As regards the tests conducted with a view to confirming the efficacy of the soap of the present invention as a medicament, which can arrest and/or reverse symptoms such as cracked skin and/or itchiness and/or weeping and/or rashes associated with skin complaints and diseases such as eczema, dermatitis, acne, psoriasis, athlete's foot and allergies; the following investigations were conducted.

[0038] A test group of approximately 30 people of mixed gender and varying age all suffering from at least one of the above skin conditions were selected.

[0039] Each member of the group was told to discontinue any previous medications they may have been using at the time to arrest or treat the symptoms associated with the skin condition/disease from which they suffered, and moreover, were instructed to wash the affected area of their body with warm water and the soap of the present invention at least twice daily.

[0040] Tabulated below are some of the results of our investigations:

Gender	Age	Condition	Symptoms	Observations
Male	43	Psoriasis	Patches of itchy, scaly skin	Symptoms alleviated within 10 days of starting treatment
Female	51	Psoriasis	Patches of itchy, scaly skin	Symptoms alleviated within 3 days of starting treatment
Female	45	Psoriasis	Patches of itchy, scaly skin	Symptoms alleviated within 4 days of starting treatment
Female	5	Eczema	Dry, itchy patches of skin	Symptoms almost eradicated after 7 days of starting treatment
Female	25	Eczema	Areas of dry, itchy skin particularly around the eyebrows, hairline and between fingers	Symptoms almost eradicated overnight
Female	25	Daffodil Allergy	Red, puffy, itchy areas of skin on arms	Symptoms eradicated almost overnight after starting treatment
Male	4	Eczema	Itchy, scratchy, weeping eyes	Symptoms eradicated by daily washing after approximately 3 days
Male	44	Athletes Foot	Itchy, cracked skin between toes	Symptoms eradicated within 3 days of starting treatment
Male	50	Athletes Foot	Itchy, cracked skin between toes	Symptoms eradicated within 4 days of starting treatment
Male	18	Acne	Acne to the face	Spots cleared up within about 8 weeks of starting treatment

[0041] The inventors also conducted a case study of a female of approximately 25 years of age who has suffered from the following conditions:

Psoriasis

[0042] The subject suffered from sporadic psoriasis around hairline, ears and eyebrows.

[0043] After utilising the soap of the present invention, the subject noticed that the areas affected by the condition were less inflamed and sore. After using the soap a second time there was a reduction in inflamed skin.

[0044] After approximately 4 days of using the soap, the sore patches cleared up.

[0045] Any re-occurrences of the symptoms associated with the condition were quickly relieved utilising the soap. The subject also observed that even when washing her face with the soap of the present invention, her skin stayed soft and remained so without irritation.

Eczema

[0046] The subject also suffered from sporadic eczema between her fingers.

[0047] At the first sign of itching, the subject utilised the soap on the affected areas. The redness and itchiness associated with her condition was alleviated almost immediately. After using the soap of the present invention 3 times in one day, the eczema had almost cleared up completely. On the second day of starting her treatment, all symptoms had diminished.

Chronic Allergic Reactions

[0048] The subject suffered from a plethora of skin reactions brought about by certain allergens.

Allergen 1

[0049] The sap of daffodils had left the subject's skin covered in a red, itchy and inflamed rash. After a week of severe discomfort, the subject utilised the soap. The symptoms associated with this condition were alleviated almost immediately after one application of the soap. After 3 days of continuing with the use of the soap, the rash had completely disappeared.

Allergen 2

[0050] The subject suffered an allergic reaction from stick sap. The sap produced a burning reaction of the skin. As soon as the subject began to feel the symptoms of an allergic reaction, the subject immediately washed the affected area thoroughly with the soap of the present invention. This stopped the reaction completely and soothed any inflammation that had started to develop. Previously, it had taken the subject between a week and a fortnight to recover from such an exposure to plant sap.

Allergen 3

[0051] The subject also reacts to exposure to sun. Usually, the exposure results in raised lumps and blotches. Could be said to resemble hives. By utilising the soap of the present invention, the subject noticed that the symptoms associated with exposure to the sun, namely, the raised lumps and blotches which prickled, were alleviated.

[0052] From the above it was observed that in all cases a marked improvement was exhibited shortly after starting treatment with the soap of the present invention.

[0053] The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

[0054] In the present specification "comprises" means "includes or consists of" and "comprising" means "including or consisting of".

Claims

1. Soap including glycerine and sapropel.

2. The soap of claim 1, wherein the soap is a sodium soap.

3. The soap of claim 1, wherein the soap is a potassium soap.

4. The soap of any one of the preceding claims, wherein the sapropel is white sapropel.

5. The soap of any one of claims 1 to 3, wherein the sapropel is black sapropel.

6. The soap of any one of the preceding claims for use as a medicament.

7. A process for making soap, the process including the steps of adding sapropel to the reactants and not removing the resultant glycerine from the end product or adding glycerine to the end product.

8. The use of the soap of any one of Claims 1 to 5 for the manufacture of a medicament for the treatment of a condition selected from the group consisting of acne, eczema, dermatitis, psoriasis, athlete's foot and skin allergies.

Patentansprüche

1. Seife einschließlich Glyzerin und Faulschlamm.

2. Seife nach Anspruch 1,
dadurch gekennzeichnet,
dass sie eine Natriumseife ist,

3. Seife nach Anspruch 1,
dadurch gekennzeichnet,
dass sie eine Kaliumseife ist.

4. Seife nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet,
dass der Faulschlamm weißer Faulschlamm ist.

5. Seife nach Anspruch 1,
dadurch gekennzeichnet,
dass der Faulschlamm schwarzer Faulschlamm ist.

6. Seife nach einem dervorhergehenden Ansprüche,
dadurch gekennzeichnet,
dass sie als Medikament verwendet wird.

7. Verfahren zur Herstellung von Seife,
gekennzeichnet durch folgende Schritte:

- den Reaktionsteilnehmern wird Faulschlamm zugefügt und
- aus dem Endprodukt wird nicht der Reaktionsteilnehmer Glyzerin entfernt oder dem Endprodukt wird nicht Glyzerin zugefügt.

8. Verwendung der Seife nach einem der Ansprüche 1 bis 5 für die Herstellung eines Medikaments zur Behandlung eines Zustands, der aus der Gruppe ausgewählt ist, die Akne, Ekzeme, Hautentzündungen, Schuppenflechten und Fuß- und Hautallergien von Athleten enthält.

Revendications

1. Savon comportant de la glycérine et du sapropèle,

2. Savon de la revendication 1, dans lequel le savon est un savon à base de sodium.

3. Savon de la revendication 1, dans lequel le savon est un savon à base de potassium.

4. Savon d'une quelconque des revendications précédentes, dans lequel le sapropèle est du sapropèle blanc,

5. Savon d'une quelconque des revendications 1 à 3, dans lequel le sapropèle est du sapropèle noir.

6. Savon d'une quelconque des revendications précédentes, destiné à une utilisation en tant que médicament.

7. Procédé de fabrication de savon, le procédé incluant les étapes d'ajouter du sapropèle aux réactifs et à ne pas éliminer la glycérine résultante du produit final ou d'ajouter de la glycérine au produit final.

8. Utilisation du savon de l'une quelconque des revendications 1 à 5 pour la fabrication d'un médicament destiné au traitement d'un état choisi parmi le groupe constitué de l'acné, de l'eczéma, de la dermatite, du psoriasis, du pied d'athlète et des allergies de la peau.

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

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Hawley's

Condensed Chemical Dictionary

Fourteenth Edition

Revised by

Richard J. Lewis, Sr.

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dynamo. Faraday was in many respects the exemplar of a true scientist, combining meticulous effort and interpretive genius.

farnesol. (generic name for 3,7,11-trimethyl-2,6,10-dodecatrienol).
CAS: 4602-84-0. $C_{15}H_{25}OH$.
Properties: Colorless liquid; delicate floral odor. D 0.885 (15C), bp 145–146C (3 mm Hg). Soluble in three volumes of 70% alcohol. Combustible.
Derivation: Found in nature in many flowers and essential oils such as cassia, neroli, cananga, rose, balsams, ambrette seed.
Use: Perfumery, flavoring, insect hormone.

fast. (1) Descriptive of a dye or pigment whose color is not impaired by prolonged exposure to light, steam, high temperature, or other environmental conditions. Inorganic pigments are normally superior in this respect to organic dyes. (2) In nuclear technology, the term refers to neutrons moving at the speed at which they emerge from a ruptured nucleus as opposed to "slow" or thermal neutrons whose speed has been reduced by impinging on a neutral substance called a moderator. Fast neutrons are used in breeder reactors.

fast atom bombardment. (FAB). One of several techniques for ionizing solids from solutions. In FAB, a thin film of the dissolved solid to be analyzed is bombarded with fast atoms. These dislocate ions by impact; the ions are then analyzed by mass spectroscopy. Peptide ions with molecular weight of approximately 6000 have been produced and analyzed by this method.

fat. A glyceryl ester of higher fatty acids such as stearic and palmitic. Such esters and their mixtures are solids at room temperature and exhibit crystalline structure. Lard and tallow are examples. There is no chemical difference between a fat and an oil, the only distinction being that fats are solid at room temperature and oils are liquid. The term fat usually refers to triglycerides specifically, whereas lipid is all-inclusive.
See lipid.

fat dyes. Oil-soluble dyes for candles, wax, etc.

fatigue. Incremental weakening of a material as a result of repeated cycles of stresses that are far lower than its breaking load, ending in failure. For metals, to which the term usually refers, the number of low-stress cycles may be of the order of 10^7. Failure is due to development of cumulative imperfections in the crystal structure, with consequent minute interior cracks. Gear failure is often caused by fatigue. It has been reported in experimental windmills for power generation in which steel blades have failed after a few hundred hours of operation due to centrifugal stress. In elastomeric materials, fatigue involves complete dissipation of their resilient energy by repeated cycles of low-order stresses.

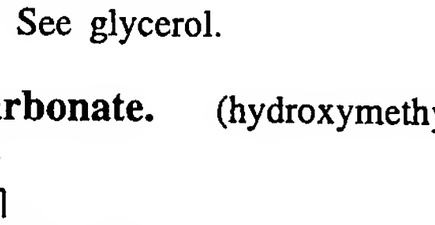
fat liquoring agent. An oil-in-water emulsion usually made from raw oils such as neatsfoot, cod, etc., made soluble by dispersing agents such as sulfonated oils.
Use: Leather processing to replace natural oils removed from hides by tanning operations.
See neatsfoot oil; emulsion.

fat splitting. See hydrolysis.

fatty acid. A carboxylic acid derived from or contained in an animal or vegetable fat or oil. All fatty acids are composed of a chain of alkyl groups containing from 4 to 22 carbon atoms (usually an even number) and characterized by a terminal carboxyl group –COOH. The generic formula for mentioned acetic is $CH_3(CH_2)_xCOOH$ (the carbon atom count includes the carboxyl group). Fatty acids may be saturated or unsaturated (olefinic), and solid, semisolid, or liquid. They are classed among the lipids, together with soap and waxes. *Saturated:* A fatty acid in which the carbon atoms of the alkyl chain are connected by single bonds. The most important of these are butyric (C_4), lauric (C_{12}), palmitic (C_{16}), and stearic (C_{18}). They have a variety of special uses (see specific entry). Stearic acid leads all other fatty acids in industrial use, primarily as a dispersing agent and accelerator activator in rubber products and soaps. *Unsaturated:* A fatty acid in which there are one or more double bonds between the carbon atoms in the alkyl chain. These acids are usually vegetable derived and consist of alkyl chains containing 18 or more carbon atoms with the characteristic end group –COOH. Most vegetable oils are mixtures of several fatty acids or their glycerides; the unsaturation accounts for the broad chemical utility of these substances, especially of drying oils. The most common unsaturated acids are oleic, linoleic, and linolenic (all C_{18}). Safflower oil is high in linoleic acid, peanut oil contains 21% linoleic acid, olive oil is 38% oleic acid, palmitoleic acid is abundant in fish oils. Aromatic fatty acids are now available.
See phenylstearic acid.
Note: Linoleic, linolenic, and arachidonic acids are called essential fatty acids by biochemists because such acids are necessary nutrients that are not synthesized in the animal body.
Use: Special soaps, heavy-metal soap, lubricants, paints and lacquers (drying oils), candles, salad oil, shortening, synthetic detergents, cosmetics, emulsifiers.

fatty acid enol ester. A fatty acid reacted with enolic form of acetone for the purpose of increasing the chemical reactivity of the acid. Stearic acid (18-carbon) combined with acetone (3-carbon) gives isopropenyl stearate (21-carbon). This is effective in making the fatty stearoyl group available for synthe-

glyceraldehyde. (glyceric aldehyde).
CAS: 56-82-6. $HOCH_2CH_2OCHO$. Isomeric with dihydroxyacetone. It is produced by the oxidation of sugars in the body. As the simplest aldose, the conformation of D- and L-glyceraldehydes has been designated the reference standard for D- and L-carbohydrates and derivatives.

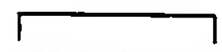


In these isomers, the central carbon atom (C*) is asymmetric.
Properties: (DL-glyceraldehyde) Tasteless crystals from alcohol-ether mixture. Mp 145C. Insoluble in benzene, petroleum ether, pentane.
Grade: 40% aqueous solution.
Use: Biochemical research; intermediate; nutrition; prepraration of polyesters, adhesives; cellulose modifier; leather tanning.

glyceride. An ester of glycerol and fatty acids in which one or more of the hydroxyl groups of the glycerol have been replaced by acid radicals. The latter may be identical or different so that the glyceride may contain up to three different acid groups. Glycerides can be made synthetically. The most common are based on fatty acids that occur naturally in oils and fats.
See monoglyceride; triglyceride.

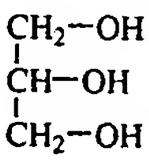
glycerin. See glycerol.

glycerin carbonate. (hydroxymethylethylene carbonate).



$CH_2O(CO)OCHCH_2OH$.
Properties: Pale-yellow hygroscopic liquid; odorless. Boiling range 125–130C (0.1–0.2 mm Hg), fp supercools to a glass, d 1.4000 (20/4C), refr index 1.4580 (20C), flash p 415F (212C). Miscible with water, alcohol, ether; soluble in ethylene dichloride; insoluble in carbon tetrachloride, benzene, and aliphatic hydrocarbons. Combustible.
Grade: Technical.
Use: Solvent, intermediate.

glycerol. (glycerin; glycyl alcohol; 1,2,3-propanetriol).
CAS: 56-81-5.



A trihydric (polyhydric) alcohol.
Properties: Clear, colorless, syrupy liquid; odorless; sweet taste; hygroscopic. D anhydrous 1.2653, USP greater than 1.249 (25/25C), dynamite 1.2620, mp 18C, bp 290C, flash p 320F (160C), autoign temp 739F (392C). Soluble in water and alcohol (aqueous solutions are neutral); insoluble in ether, benzene, and chloroform and in fixed and volatile oils. Combustible.
Derivation: (1) By-product of soap manufacture; (2) from propylene and chlorine to form allyl chloride, which is converted to the dichlorohydrin with hypochlorous acid; this is then saponified to glycerol with caustic solution; (3) isomerization of propylene oxide to allyl alcohol, which is reacted with peracetic acid, (the resulting glycidol is hydrolyzed to glycerol); (4) hydrogenation of carbohydrates with nickel catalyst; (5) from acrolein and hydrogen peroxide.
Method of purification: Redistillation, ion-exchange techniques.
Grade: USP, CP (pharmaceutical and commerical, where highest grade is required), saponification soap lye, crude yellow distilled (for commerical purposes where color and extreme purity are not factors), high gravity or dynamite (dehydrated to 99.8–99.9% purity), natural, synthetic, FCC.
Hazard: TLV: (vapor) 10 mg/m³.
Use: Alkyd resins, dynamite, ester gums, pharmaceuticals, perfumery, plasticizer for regenerated cellulose, cosmetics, foodstuffs, conditioning tobacco, liquors, solvent, printer's ink rolls, polyurethane polyols, emulsifying agent, rubber stamp and copying inks, binder for cements and mixes, special soaps, lubricant and softener, bacteriostat, penetrant, hydraulic fluid, humectant, fermentation nutrients, antifreeze mixtures.

glycerol boriborate.
Properties: Pale-yellow liquid obtained by heating glycerol, sodium borate, and boric acid; composition varies, soluble in cold water, absolute alcohol, other alcohols, glycerol.
Use: Adhesive, binder, fabric softener, fire-retardant on fabrics.

glycerol dichlorohydrin. See α-dichlorohydrin.

glycerol-1,3-distearate. (glyceryl-1,3-distearate). $C_{39}H_{76}O_5$.
Properties: Solid. Mp 29.1. Very slightly soluble in cold alcohol and ether; soluble in hot organic solvents.

glycerol monolaurate. (glyceryl monolaurate). $C_{11}H_{23}COOCH_2CH_2OCH_2OH$.
Properties: Cream-colored paste; faint odor. Mp 23–27C, d 0.98, FFA <2.5%, iodine value 5–8, pH 8.0–8.6 (25C) (5% aqueous dispersion). Dispersible in water; soluble in methanol and ethanol, toluene, naphtha, mineral oil, cottonseed oil, ethyl acetate. Combustible.
See monoglyceride.
Grade: Edible, technical.
Use: Emulsifying and dispersing agent for food prod-